PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB2004/003968	02.12.2004	04.12.2003

International Patent Classification (IPC) or both national classification and IPC
C09B67/26, C09B67/54, C09B67/22

Applicant
CLARIANT INTERNATIONAL LTD

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/IB2004/003968

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☐ in written format

   ☐ in computer readable form

   c. time of filing/furnishing:

   ☐ contained in the international application as filed.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	3,4,10-12,14,15
	No:	Claims	1,2,5-9,13
Inventive step (IS)	Yes:	Claims	10-12
	No:	Claims	1-9,13-15
Industrial applicability (IA)	Yes:	Claims	1-15
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

and / or

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

see form 210

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (SEPARATE SHEET)

International application No.
PCT/IB2004/003968

D2: US -A- 4 955 987
D3: EP -A- 0 288 434
D4: EP -A- 0 210 378
D5: EP -A- 0 114 031
D6: EP -A- 0 029 960
D7: DE -A- 3 148 878
D8: CH -A- 0 648 584
D9: WO -A- 01/32786

V.1. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1,2,5-9,13. is not new in the sense of Article 33(2) PCT.

V.1.1. D9: WO -A- 01/32786

The direct dyes Direct Blue 75 and Direct Blue 78 are listed in the table on page 13 of D9 as candidates for the ultra filtration process disclosed therein. The steps listed in claim 1 of D9 include an ultrafiltration and a concentration step. No solubilisers, dispersants or tensides are added during the process; storage stable preparations are produced. Alkanole amines are added in some cases as a base, obviously for the same purpose as in the preferred variation of the current process (page 4, lines 30-33).

It is also a technical problem underlying D9 to prepare storage stable preparations of anionic dyes: "..... Furthermore, on storage, especially at temperatures below room temperature, there are often formed in the concentrated solutions deposits which either cannot be redissolved at all or can be redissolved only by carrying out addition work....." (page 1, par. 1; see also the remarks in the examples).

D9 is rated as a novelty destroying document for claims 1,2,5-9,13.

V.2. Claims 3,4,14,15 are regarded not being inventive.

V.2.1. Direct Blue 71 shows only minor structural differences to the dyes Direct Blue 75 and Direct Blue 78 whereby being used for the same dyeing purposes (e.g. paper dyeing). A skilled person would also apply the process of D9 to D.B. 71 to solve the above mentioned technical problem. Claims 3 and 4 are not inventive over D9.

V.2.2. Claims 14,15 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.

V.3. The subject matter of claims 10-12 seems not be be obvious from the disclosed prior art.

VII. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D2-D9 is not mentioned in the description, nor are these documents identified therein.

D2: US -A- 4 955 987
D2 deals with exchanging cations by Li+ resp. NH4+ to increase solubility during membran process and subsequent storage period, thereby avoiding the use of solubilizers, which disadvantages are reported by the D2-authors.
No tris-azo dyes are membran treated
D3: EP -A- 0 288 434
D3 mentions the optional addition of e.g. solubilizing agents, solvents, surfactants 'and the like' before or during the process for the preparation of concentrated aqueous dye formulations by desalination and concentration by membrane separation. In some examples additives are added, in some not; trisazo dyes are not treated in the membran process of D3.
D4: EP -A- 0 210 378
D4 (preparing of concn. aq. soln. of of anionic dyestuffs by 'cation exchange of soln.' or dispersion with cation exchanger beds to increase solubility) deals with other dyes (trisazos not mentioned) and generally adds solubility enhancers.
D5: EP -A- 0 114 031
D5 [process for the preparation of stable aqueous solutions of water-soluble reactive dyes by membrane separation] also mentions, that, besides buffers, a component which improves the water-solubility of the dye is optionally added to the concentrated and desalted solution (e.g. epsilon-caprolactam, N-methylpyrrolidone etc.)
Trisazo dyes are not mentioned in D5.
D6: EP -A- 0 029 960
D6 deals with concentrated aqueous preparations of reactive dyestuffs (high stability in storage) free of solvents, and a process for their preparation, which comprises a membrane separation process. Urea is proposed as an additive thereby leading to the increased storage stability; the examples mention exclusively monoazo reactive dyes.
D7: DE -A- 3 148 878

Storage-stable, liquid, aqueous dye preparations of reactive dyes are obtained from the as-synthesised dye solutions by a membrane separation process; the D7-process does it obviously without the addition of solubilisers, dispersants resp. tensides. As it seems, buffers are the only additives added to the final solution. D7 is silent about non-reactive trisazo dyes.

D8: CH -A- 0 648 584

A non-reactive trisazo dye is membrane-treated in the process of example 19 of D8. No additional solubilisers, dispersants or tensides are added. The solution is very stable and poor in salt content. The dye differs from those of current claim 1 in that a second SO3H group is attached to the right naphthol moiety, two copper cations are linked to give a complex dye and an azoxy group is present in the middle of the molecule. Claims 1 and 9-15 therefore seem to be novel over example 19.

The problem underlying the current application can be seen in 'providing an alternative process for the preparation of storage-stable solutions of anionic trisazo dyes'.

The solution is the process defined in claim 1, which avoids the additional use of solubilisers, dispersants or tensides. The critical technical point of D8 is a process free of organic solvents, whereby the addition of solubilisers is a further option:

"..... Die erfindungsgemässen konzentrierten flüssigen Präparationen können als weitere Zusätze .....Lösungsvermittler wie Caprolactam, Trimethyloläthan, Milchsäureamid oder Tetrahydroxymethylmethan (Pentaerythrit).....[enthalten]...."

Avoiding such chemicals presents the critical technical feature of current claim 1.

D8 therefore seems to lead the skilled person away from current claim 1 by seeking an alternative solution for obtaining storage stable anionic dye solutions.

VII.

VIII. The applicant should deal with the following objections:

VIII.1. On page 8, line 13, a formulation j) is mentioned, which is not listed on the top of the same page [comparitive examples run from a) to i)].

VIII.2. There is a contradiction between page 4, lines 30-33 and the comparitive examples on pages 7,8 [esp. items i),f)h)]. Current claim 1 clearly excludes solubilisers (as well as dispersants and tensides) as further additives during the process. Alkanolamines resp. their ammonium salts can serve as solubilisers. Though, the addition of such compounds is mentioned on page 4 (as counterion replacement). In the light of the description, page 4, claim 1 therefore is not clear with respect to the addition of

compounds which could serve as solubiliser.
The applicant should clarify this.

VIII.3. This application deals exclusively with **liquid** dyestuff preparations; the term **liquid** should therefore also be introduced into the wording of claim 1 resp. in all independent claims where appropriate.